

Heads Up: Real News About Drugs and Your Body

Brought to you by Scholastic and the scientists at the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services

LESSONS & WORKSHEETS INSIDE:

How Do Genes Affect Addiction?

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AVAILABLE ONLINE:

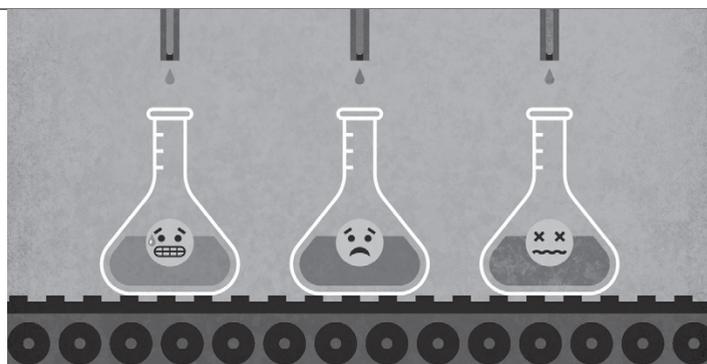
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- Leveled Student Articles (4th-6th grade reading levels)
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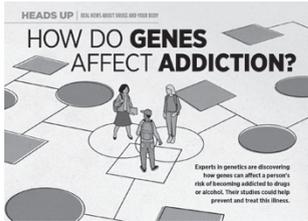


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- For this Heads Up **Teacher Edition Compilation** refer to **NIH Pub No. 18-DA-8033**.
- For the accompanying Heads Up **Student Edition Compilation** refer to **NIH Pub No. 18-DA-8032**.

Visit scholastic.com/headsup/teachers and teens.drugabuse.gov for more information.

TEACHER'S GUIDE



HOW DO GENES AFFECT ADDICTION?

Experts in genetics are discovering how genes can affect a person's risk of becoming addicted to drugs or alcohol. Their studies could help prevent and treat this illness.

Why do some people become addicted to alcohol, tobacco, or other drugs while others do not? They are not all the same. Some people are more likely to become addicted than others. Scientists are trying to understand why. Many different factors can contribute to a person's risk for addiction. **Genetics and Heredity** All of our traits, from our hair color to your strength, are influenced by your genes. These segments of DNA contain instructions for making the proteins that are used to build the body's cells. These proteins can direct all of the processes that occur inside your cells. Genes for the same trait can have different forms, called **alleles**. Alleles can be passed from one family member to another with

How Do Genes Affect Addiction? National Institute on Drug Abuse

One of the keys to preventing negative consequences of drug and alcohol use is determining what puts people at risk for addiction. In the article “How Do Genes Affect Addiction?” students will learn about the role of genetics in a person’s risk for addiction, as well as learn that genetics isn’t the only factor that influences the risk. Many other biological and environmental factors play a role, and students will get tips about choices they can make to reduce their risk. By sharing the article and skills sheet (see reverse side) with your students, and teaching the lesson below, you can help them understand the risks and how to stay safe.

Subject

- Science Literacy
- English Language Arts
- Health/Life Skills

Common Core State Standards

- RST.6-8-1 / RST.9-10.1
- Cite specific textual evidence to support analysis of science and technical texts

W.6-8-1 / W.9-10.1

- Write arguments to support claims, using valid reasoning and relevant and sufficient evidence

Next Generation Science Standards

MS-LS3.A / HS-LS3.A

- Inheritance of Traits
- MS-LS3.B / HS-LS3.B
- Variation of Traits

National Science Education Standards

- Reproduction and Heredity
- Personal Health

National Council for the Social Studies

- 4. Individual Development and Identity
- 8. Science, Technology, and Society

Tiered Vocabulary Tools:

- scholastic.com/headsup/teachers/how_do_genes_affect_addiction

Additional Teaching Resources:

- headsap.scholastic.com/teachers
- teens.drugabuse.gov

Critical-Thinking Questions

- 1) How might doctors use genetics to prevent or treat addiction in the future? *(Answers may include that genetics might determine if a person's genes put them at a higher risk for addiction. People who may have an increased risk because of genetics could be provided with counseling or other interventions. Doctors may one day be able to develop medications that can reverse the effects of high-risk genes.)*
- 2) Do you think scientists will find a single “addiction gene” that determines if someone will become addicted to drugs? Why or why not? *(Answers may include that it is unlikely that a single addiction gene exists. There are many factors that determine whether a person becomes addicted to drugs or not. Genes might affect how a person reacts to drugs, but they don't guarantee that a person will or will not develop an addiction.)*
- 3) Why is it important for people to understand the risk factors for addiction? *(Answers may include that knowing their risk can help people make healthy choices; people can take actions that reduce risk factors, such as not taking drugs during adolescence.)*

Writing Prompts

- **Grades 6–8:** Explain how genes could increase or decrease a person’s risk for addiction.
- **Grades 9–10:** What are two reasons genetics research is important in understanding and treating addiction? Use evidence from the text to support your answer.
- **Grades 11–12:** Do you think individuals can control their risk for addiction? Why or why not?

Student Skills Sheet

The worksheet on the reverse side provides students with information about some of the different factors that can affect a person’s risk for addiction and asks critical-thinking questions about the information. Possible answers include:

1. A protective factor is something that reduces the risk for addiction, such as strong family bonds or having friends who don’t use drugs. A risk factor is something that increases a person’s addiction risk, such as a family history of addiction or a lack of parental supervision. *(Examples are found in the table.)*
2. A person with no family history of addiction and strong family bonds can still be at risk for addiction. These two factors alone do not determine whether or not a person will develop an addiction. Many factors can come into play, and everyone reacts differently to situations.
3. A person can reduce his or her risk by increasing the number of protective factors in his or her life, such as spending time with people who are a positive influence and don’t use drugs; not taking drugs at a young age; and getting involved in after-school activities such as music, sports, or school clubs.

Interactive Activity

- “PI: Pedigree Investigator, On the Case of Nicotine Addiction” (learn.genetics.utah.edu/content/addiction/pi/)

This activity gives more information about how pedigrees are constructed and has students complete one to see how nicotine addiction runs in a family.

- **Writing Prompt:** Does the family described in the activity support the theory that there is a genetic component to nicotine addiction? Use at least three pieces of evidence to support your answer. Explain how using a pedigree helped you determine your answer.

WHAT AFFECTS THE RISK FOR ADDICTION?

Scientists have identified many of the factors that can increase—and decrease—a person’s risk for addiction.

Risk factors can increase the likelihood of becoming addicted to alcohol, tobacco, and/or other drugs. They include biological factors—such as a person’s genetics and gender—and factors that come from the environment, including peer pressure or family relationships. **Protective factors** are biological or environmental factors that help to decrease a person’s risk for addiction, such as strong community bonds and friends who are a positive influence.

In general, the more risk factors and the fewer protective factors a person has, the higher the chance for addiction. However, every individual is different. A person can still become addicted to drugs even if he or she has few risk factors. And most people who are at risk never become addicted to drugs. Study the table at the right to learn about some of the factors that affect the risk for addiction.

Directions: Study the information in the table below. Then use it along with the information from the article “How Do Genes Affect Addiction?” to answer the questions below. Write your answers on a separate piece of paper.

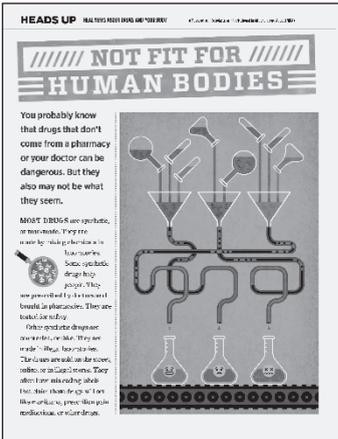
Risk and Protective Factors for Addiction

 RISK FACTORS	 PROTECTIVE FACTORS
<ul style="list-style-type: none"> • Family history of addiction • Lack of parental supervision • Lack of strong family bonds • Friends or family who use alcohol, tobacco, or other drugs • Availability of drugs • Drug use during adolescence • Mental health problems such as depression • Stress • Exposure to trauma or violence 	<ul style="list-style-type: none"> • Strong family bonds • Parental supervision and involvement • Friends who are a positive influence and don’t use drugs • Strong neighborhood/ community • Clear anti–drug use policies at home and in school • Strong performance in school • Participation in after-school activities • Having strategies to cope with stress

QUESTIONS:

1. Explain the difference between a protective factor and a risk factor for addiction. Give at least one example of each.
2. Suppose a person has no family history of drug addiction and has strong bonds with his or her parents. Is it guaranteed that the person will not become addicted to drugs or alcohol themselves? Support your answer with evidence from the texts.
3. Suppose a person has uncontrollable risk factors for addiction, such as a genetic history of the disease. How can the person reduce his or her own risk? Explain at least two specific actions that can be taken.

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W.6-8.1 / W.9-10.1

- Write arguments to support claims, using valid reasoning and relevant and sufficient evidence

Next Generation Science Standards

MS-PS1.A / HS-PS1.A

- Structure and Properties of Matter

MS-LS3.B / HS-LS3.B

- Information Processing

National Science Education Standards

- Properties and Changes of Properties in Matter/ Structure and Properties of Matter
- Personal Health

National Council for the Social Studies

- 4. Individual Development and Identity
- 8. Science, Technology, and Society

Not Fit for Human Consumption

In recent years, there has been a rise in the number of health emergencies and overdoses related to drugs that are made illegally in laboratories. Synthetic drugs are created in these labs to mimic the effects of other, more commonly known substances, such as marijuana and prescription pain medications. But these unregulated drugs can be even more dangerous than their counterparts. In “Not Fit for Human Consumption,” students will learn what synthetic drugs are and why they are dangerous. You can help students stay safe from synthetic drugs by sharing the article and paired worksheet (see reverse side), and teaching the lesson below.



Critical-Thinking Questions

- 1) Why might a synthetic drug pose more health risks than its more familiar counterpart? Use evidence from the text to support your answer. *(Answers may include: Synthetic drugs made in illegal laboratories may have different chemicals that make them more powerful. There is no way to know what chemicals the drugs contain and in what amounts. The chemicals in synthetic drugs can have different or stronger effects on the body. For example, synthetic cannabinoids have a stronger effect on the brain than THC, the main active ingredient in marijuana.)*
- 2) Officials try to reduce the misuse of drugs by regulating their use and making them illegal. Why is this approach difficult with synthetic drugs? *(Answers may include that the makers of synthetic drugs can add misleading labels to products, such as “Not Fit for Human Consumption.”)*
- 3) Why is it important to use only prescription medications that have been prescribed by a doctor and bought directly from a pharmacy? *(Answers may include that medications such as pills bought on the street or online may be counterfeit. The effects of these medications can be unpredictable and may be deadly because they may contain hidden chemicals such as fentanyl.)*

Writing Prompts

- **Grades 6–8:** Explain what a synthetic drug is and how it is different from the drug it is designed to mimic.
- **Grades 9–10:** The article states that the effect of synthetic drugs is unpredictable. Use evidence from the text to support this statement.
- **Grades 11–12:** The U.S. is currently experiencing an overdose crisis related to opioids. How might synthetic drugs play

a role in this crisis? Use evidence from the text to support your answer.

Student Worksheet

The worksheet on the reverse side includes fill-in-the-blank questions to reinforce comprehension of the article. It also includes a prompt for students to use the information they have learned to create a poster warning teens about the dangers of synthetic drugs.

Answers—Part 1:

1. laboratories; designed.
2. powerful.
3. Spice; K2; cannabinoids.
4. THC.
5. “bath salts.”
6. Counterfeit; fentanyl.
7. misleading.
8. addiction; overdose.

Part 2: Each student poster, flyer, or meme should include elements that grab the reader’s attention, such as startling facts or statistics or eye-catching visuals. It should include facts about why synthetic drugs are dangerous and advice about how to stay safe.

Tiered Vocabulary Tools

Visit scholastic.com/headsup/not_fit_for_human_consumption for a tiered vocabulary list to support this article.

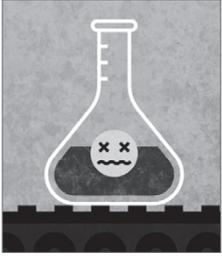
Paired Reading

- “Drug Facts: Spice” (<https://teens.drugabuse.gov/drug-facts/spice>)
- **Writing Prompt:** Explain the dangers of the synthetic drug Spice. Include why it may affect a person’s body differently than marijuana. Use text evidence from “Not Fit for Human Consumption” and “Drug Facts: Spice” to support your answer.

Additional Teaching Resources

- headsup.scholastic.com/teachers
- teens.drugabuse.gov

HOW MUCH DO YOU KNOW ABOUT SYNTHETIC DRUGS?



Part 1: Use the information from the article “Not Fit for Human Consumption” to answer the questions below about synthetic drugs and their effects.

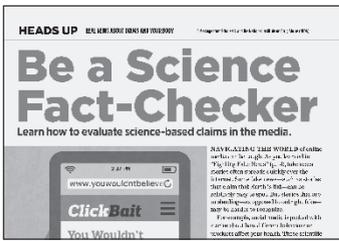
THC	cannabinoids	laboratories	stimulant	counterfeit	designed
K2	addiction	misleading	overdose	cathinones	powerful
Spice	synthetic	natural	“bath salts”	fentanyl	reduce

1. Synthetic drugs made in illegal _____ can contain chemicals _____ to act like other drugs.
2. One reason synthetic drugs are dangerous is they often have added chemicals that make them more _____.
3. _____ and _____ are drugs made of dried plant leaves sprayed with synthetic _____ that can cause dangerous health problems, including heart attacks.
4. _____ is the main active ingredient in marijuana.
5. Like the stimulant drugs they mimic, _____ contain chemicals called cathinones, which can cause hallucinations, paranoia, and a dangerous increase in heart rate.
6. _____ prescription medications sold on the street have been found to contain hidden amounts of the powerful synthetic opioid _____.
7. The producers of illegal synthetic drugs sometimes package the drugs with labels that are _____.
8. Both legitimate and illegal synthetic opioids can pose a high risk for _____ and _____.

Part 2: Use the information in the article and your own internet research from reliable sources to create a poster, flyer, or meme warning other teens about the dangers of synthetic drugs.

Points to consider: What images can you use to grab the reader’s attention? What important facts do you think people need to know? What advice would you give teens about synthetic drugs?

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National Science Education Standards

- Personal Health
- Science and technology in society/Science and technology in local, national, and global challenges

National Council for the Social Studies

- 8. Science, Technology, and Society

TOOLS & RESOURCES

Vocabulary Tools

Visit scholastic.com/headsup/sciencefactchecker for a vocabulary list to support this article.

Additional Teaching Resources

headsup.scholastic.com/teachers and teens.drugabuse.gov

Be a Science Fact-Checker

Science literacy is an important skill for everyone. That’s especially true for teens who are inundated with stories on social media about important topics such as their health. Many of the articles found on Facebook or Twitter make claims that are not backed up by scientific evidence. By sharing the student article “Be a Science Fact-Checker” and teaching the lesson plan below, you will help students build skills that let them separate good science from misinformation. In the paired worksheet (see reverse side), students will put these tools to use by critically analyzing a story in which scientific facts were misrepresented, with some serious health consequences.



Critical Thinking

- 1) Today, there are many different types of sites that publish what appear to be news stories about science and health. Explain why it is important to research these sites before reading the articles. What questions might you ask about the sites? (*Answers may include that sites may have a bias, such as to sell health products, or may publish articles that make claims that are not backed by scientific evidence. You might ask who created the site and what their affiliation is, what the original source is for the stories they publish, etc.*)
- 2) Misleading news articles often spread over the internet faster than factual articles from mainstream sources. Why do you think this is true? (*Answers may include that misleading articles often have exaggerated headlines or make surprising claims. These articles catch readers’ attention and may cause them to be shared more often.*)
- 3) “Fake news” is a term that has been used recently to describe many different types of news. According to most media experts, “fake news” is something that intentionally contains false or inaccurate information. What are some reasons a science article might be labeled “fake news”? Cite evidence from the text to support your answer. (*Answers may vary but may include an article that describes research from a known biased source without revealing the bias, or an article that makes claims that aren’t supported by the study, etc.*)

Writing Prompts

- **Grades 6–8:** Explain why it is important to read an article completely before you make a judgment about what it says.
- **Grades 9–10:** Explain why it is important for journalists to find out more about the scientists who have conducted research before they write an article about the results of a study.

- **Grades 11–12:** Experts warn social media users: “Think before you share.” Use information from the article to explain why this is important. What steps should readers take before they click “Share”?

Paired Reading

- **“Say What? ‘Scientific Method’”**
<https://teens.drugabuse.gov/blog/post/say-what-scientific-method>
- **Writing Prompt:** What is replication? How does it help prevent misleading or inaccurate science stories from being published? Use text evidence from “Say What? ‘Scientific Method’” and “Be a Science Fact-Checker” to support your answers.

Student Worksheet

The worksheet on the reverse side includes a news story about a study on drugs and addiction. Students will read and analyze the story using the critical-reading tips they learned in the student article. They then will answer questions to explain ways in which the story may be misleading, and they’ll cite evidence to support their arguments.

Answers: 1. Answers will vary but may include the following points as supporting evidence: The headline exaggerates the findings of the study; the research was published as a one-paragraph letter to the editor and was not a peer-reviewed article.

2. Answers will vary but may include the following points: a) The study did not include sufficient evidence to support the claim that opioids are not addictive. b) The study did not include patients who were given opioid prescriptions to use at home. These patients may be more likely to develop addiction than those using the drugs in the hospital. c) The study assumed that patients with no record of addiction treatment in their medical reports did not develop the disease. Patients could have developed addiction, but it was never reported in their records.

CAN YOU SPOT MISLEADING NEWS?

In the article “Be a Science Fact-Checker,” you learned that news articles are sometimes misleading. If inaccurate news spreads, it can have serious consequences.

For example, in 1980, a paragraph written by two researchers appeared in the letter to the editor section of a scientific journal. The scientists presented data about how often

addiction developed in patients who had been given opioid drugs in the hospital. Opioids are powerful pain medications that are highly addictive. But according to the letter, few hospital patients developed addiction.

The letter has frequently been cited in other articles as evidence that opioids are not addictive. But it is now known that this conclusion was

misleading. Drug companies that make opioid medications used the letter to persuade doctors that the drugs had a very low risk of addiction. In the following years, the number of opioid prescriptions increased dramatically. This inaccurate interpretation has contributed to the growing misuse of the drugs and has led to a deadly overdose crisis.

ACTIVITY

DIRECTIONS: In this activity, you’ll use the tools you learned in “Be a Science Fact-Checker” to critically analyze a misleading news article about the letter described above. Read the article “Drugs Don’t Cause Addiction” (at right) and identify ways in which it is misleading. Then answer the questions below on a separate piece of paper.

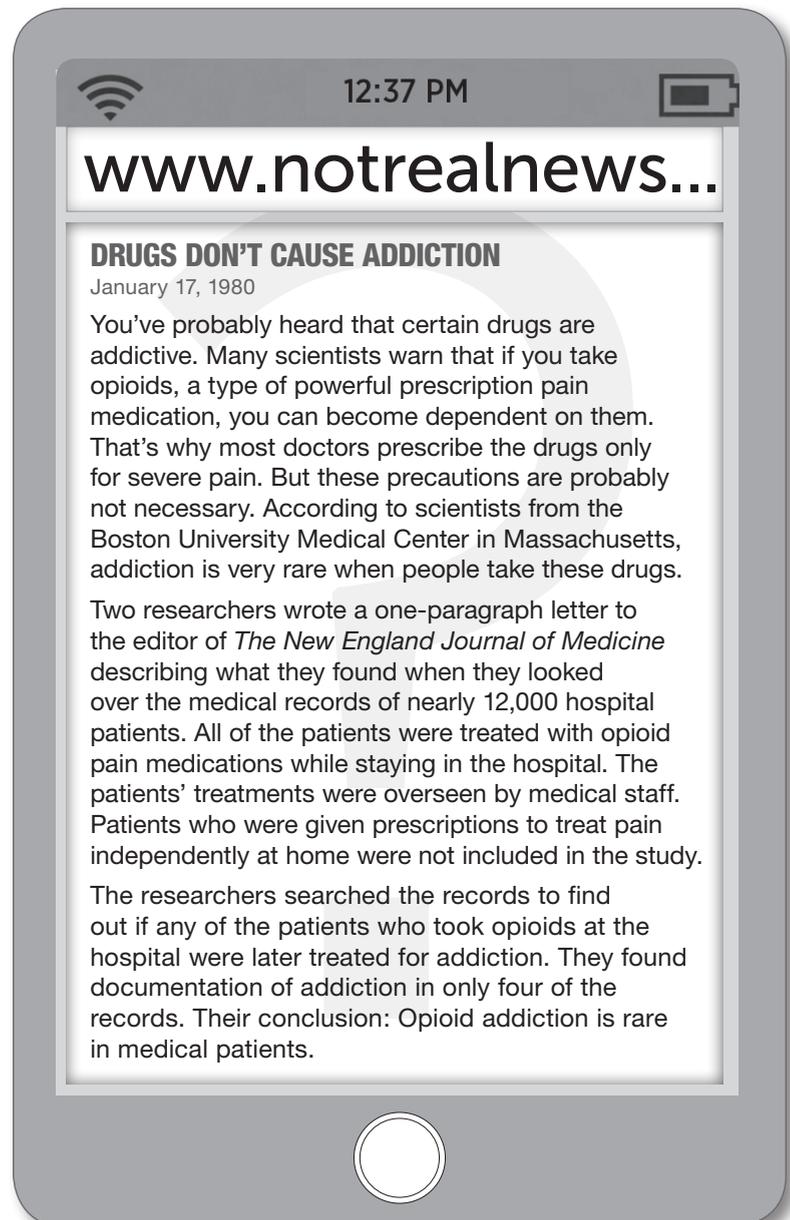
QUESTIONS

1. How is this article misleading?

Use the five critical-reading questions from the article “Be a Science Fact-Checker” to analyze the article. What is inaccurate or misleading in this article? Describe at least two factors that support your argument.

2. What evidence is missing?

The article contains other clues that the claim that opioids are not addictive is not backed by sufficient evidence. Think critically about how the study was conducted. Did the scientists collect all of the relevant data to support the conclusion? Describe at least one limitation of the study. Cite evidence from the text to support your answer.



MORE FREE TEACHER RESOURCES:
scholastic.com/headsup/teachers

**Lessons, Texts
& Printables**



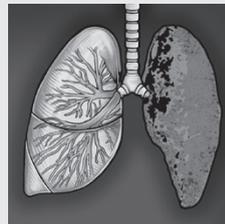
Science/ELA materials that teach important facts and elicit critical thinking

Videos



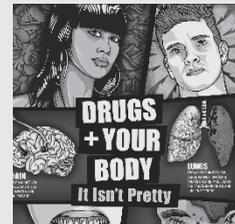
Classroom videos that illustrate the science of drug misuse

Interactives



Dynamic online supplements that engage students in core information

**Poster/
Teaching Guides**



Engaging visuals with activities for comprehension and reinforcement

COMPILATION 2017-18 Teacher Edition

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National Institute
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